Space Weather Forecast

Issued on Friday 27 December 2024 at 12:05 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate radio blackouts (R1/R2) likely throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity reverted to Low, with occasional upper-tier Common-class flares observed, peaking at 26/1845UTC from a region near the eastern solar horizon.

There are now up to 14 sunspot regions on the facing side of the Sun, with two regions near the eastern solar horizon and the redevelopment of one in the northwest. Of these, there are five main sunspot regions on the Earth-facing side at present, all large and magnetically complex.

The current southern hemisphere far side is proving a fertile breeding ground for Coronal Mass Ejections (CMEs), with a good many observed through the Christmas period heading south and later southeast from the far side, implying the presence of a large and active region here - potentially of note into the New Year period.

Front-sided activity was more limited (with the caveat of continuing lengthy imagery gaps in ground-based telescopes), and only periodic triangulating satellite imagery). There have been a large number of CMEs in the period to render analysis more difficult, however the salient points under investigation include a possible 'filament eruption' from near a sunspot region in the northeast at 26/1900UTC. Secondly, a possible weak disappearing filament left the vicinity of the same group at 27/0800UTC - there is not yet imagery available for this later event.

No new CMEs are confirmed as being Earth-bound at the time of writing.

Solar Wind / Geomagnetic Activity: Solar winds showed a slow regime, with background solar wind speeds observed, and unremarkable measures for the numbers of particles passing Earth and their associated magnetic field. The net result of the above solar wind measures was provisionally quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: High energy proton flux (greater than 10MeV) at GOES18 showed a continuing gradual decline below 1pfu, well below the 1-pfu S1/Minor Radiation Storm threshold.

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Met Office

Space Weather Forecast

Four-Day Space Weather Forecast Summary

Solar Activity: Occasional Moderate-class flares are Likely, with a Slight Chance of isolated Strong-class flares throughout.

Solar Wind / Geomagnetic Activity: No 'coronal hole' fast winds nor CMEs currently feature in the forecast. Confidence in this assertion is lower than usual given the weight of numbers of recent CME events on the whole Sun.

Geomagnetic activity is expected to be mainly quiet, but with a Slight Chance of Active intervals should any glancing CME effects occur - perhaps more likely on 28 and 29 December.

Energetic Particles / Solar Radiation: There is a Slight Chance of S1/Minor Radiation Storm or greater enhancements during the period. In the absence of any further notable flares, ongoing proton counts should continue to ease towards background levels in the coming days.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	70	70	70	70
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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